

# SEQUENCE LISTING

<110> Carozzi, Nadine  
Hargiss, Tracy  
Koziel, Michael G.  
Duck, Nicholas B.  
Carr, Brian

<120> AXMI-006, A Delta-Endotoxin Gene and  
Methods for Its Use

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<150> 60/448,806

<151> 2003-02-20

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<213> *Bacillus thuringiensis*

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Thr Ser Pro Tyr Phe Pro Asn Arg Asn Ser Asn Asp Ser Arg Tyr Pro	
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Tyr Thr Asn Asn Pro Asn Gln Pro Leu Gln Asn Thr Asn Tyr Lys Glu	
35 40 45	
tgg ctc aat atg tgt caa ggg aat aca caa tat ggt gat aat ttc gag	192
Trp Leu Asn Met Cys Gln Gly Asn Thr Gln Tyr Gly Asp Asn Phe Glu	
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aca ttt gct agt gct gat aca att gct gca gtt agt gca ggt act att	240
Thr Phe Ala Ser Ala Asp Thr Ile Ala Ala Val Ser Ala Gly Thr Ile	
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Val Ser Gly Thr Leu Leu Ala Gly Ile Gly Gly Leu Thr Ser Ile Ser	
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Gly Pro Ile Gly Ile Ile Gly Ala Ile Ile Ile Ser Phe Gly Thr Leu	
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Ile Thr Val Phe Trp Pro Ala Gly Glu Gln Asp Lys Thr Val Trp Thr	
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Gln Phe Ile Lys Met Gly Glu Ile Phe Val Asp Thr Pro Leu Thr Glu	
130 135 140	
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Ser Ile Lys Gln Leu Lys Leu Gln Thr Leu Glu Gly Phe Arg Gln Ile	
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Leu Thr Leu Lys Ile Arg Phe Glu Asn Val His Asn Asp Phe Ile Arg	
195 200 205	
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210 215 220	
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Ile Tyr Ala Gln Ala Ala Asn Phe His Leu Asn Leu Leu Gln Gln Gly	
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gct gaa ttg gct gat gaa tgg aat gca gat ata cat cct tca caa att	768
Ala Glu Leu Ala Asp Glu Trp Asn Ala Asp Ile His Pro Ser Gln Ile	
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Glu Pro Asn Ala Gly Thr Ser Asp Asp Tyr Tyr Lys Leu Leu Lys Glu	
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Asn Ile Pro Lys Tyr Ser Asn Tyr Cys Ala Asn Thr Tyr Arg Thr Gly	
275 280 285	
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Leu Lys Asn Leu Arg Asp Glu Pro Asn Met Lys Trp Ser Ile Phe Asn	
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gac tat cga aga tat atg acc att act gta tta gat acc atc tct caa	960
Asp Tyr Arg Arg Tyr Met Thr Ile Thr Val Leu Asp Thr Ile Ser Gln	
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Phe Ser Leu Tyr Asp Ile Lys Arg Tyr Arg Asp Ser Ile Gly Gly Ile	
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Glu Ile Asn Phe Asp Arg Leu Pro Gln Leu Arg Val Gln Pro Asn Leu	
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Thr Ile Arg Pro Phe Glu Ser Tyr Lys Val Ser Ile Val Thr Asp Arg	
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Gln Ser Pro Pro Val Ser Pro Ile Gln Pro His Phe Ile Ile Asn Gln	
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Ile Glu Leu Tyr Leu Asn Gly Ser Ser Asn Asn Thr Leu Lys Tyr Ser	
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Ala Gly Gly Ser Leu Ser Asn Tyr Gln Asn Thr Thr Phe Phe Gln Phe	
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Pro Arg Lys Lys Asp Cys Asn Leu Val Ile Asp Pro Gly Cys Ser Pro	
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aac ttt aat aac tat agt cat att tta tcc cat ttt tca tta ttt act	1584
Asn Phe Asn Asn Tyr Ser His Ile Leu Ser His Phe Ser Leu Phe Thr	
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tat tcc tat gtg att gga tta cag cta caa ata tta gat aca ggt gta	1632
Tyr Ser Tyr Val Ile Gly Leu Gln Leu Gln Ile Leu Asp Thr Gly Val	
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Leu Gly Trp Thr His Ser Ser Val Asp Arg Tyr Asn Ala Ile Ser Asp	
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Lys Ile Ile Thr Met Ile Pro Ala Ile Lys Gly Asn Asn Leu Asp Thr	
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Tyr Leu Gln Ser Gln Gly Arg Leu Glu Ile Thr Cys Glu Thr Pro Asn	
595 600 605	
tct aca caa tct tat ttc att aga ctt cga tat gct aca aat ggt gct	1872
Ser Thr Gln Ser Tyr Phe Ile Arg Leu Arg Tyr Ala Thr Asn Gly Ala	
610 615 620	
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Gly Asn Thr Leu Pro Asn Ile Ser Leu Thr Ile Pro Gly Val Ile Gly	
625 630 635 640	
ata cca cct caa cga ctc aac aac act ttt tct ggt aca aat tat aat	1968
Ile Pro Pro Gln Arg Leu Asn Asn Thr Phe Ser Gly Thr Asn Tyr Asn	
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Asn Leu Gln Tyr Gly Asp Phe Gly Tyr Phe Gln Phe Pro Ser Thr Val	
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aca tta cct tta aat cga aac ata cca ttt ata ttt aat cgt gca gat	2064
Thr Leu Pro Leu Asn Arg Asn Ile Pro Phe Ile Phe Asn Arg Ala Asp	
675 680 685	
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Val Ser Asn Ser Ile Leu Ile Ile Asp Lys Ile Glu Phe Ile Pro Ile	
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<212> PRT

<213> Bacillus thuringiensis

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Asn	Phe	Asn	Asn	Tyr	Ser	His	Ile	Leu	Ser	His	Phe	Ser	Leu	Phe	Thr
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Thr	Leu	Pro	Leu	Asn	Arg	Asn	Ile	Pro	Phe	Ile	Phe	Asn	Arg	Ala	Asp
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<211> 1176

<212> PRT

<213> *Bacillus thuringiensis*

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Tyr	Thr	Pro	Ile	Asp	Ile	Ser	Leu	Ser	Leu	Thr	Gln	Phe	Leu	Leu	Ser
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Glu	Phe	Val	Pro	Gly	Ala	Gly	Phe	Val	Leu	Gly	Leu	Val	Asp	Ile	Ile
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Val	Phe	Gly	Gln	Arg	Trp	Gly	Phe	Asp	Ala	Ala	Thr	Ile	Asn	Ser	Arg
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Asn	Ser	Gln	Tyr	Asp	Gln	Leu	Gln	Ala	Asp	Thr	Asn	Ile	Ala	Met	Ile	
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Glu	Gly	Cys	Val	Thr	Ile	His	Glu	Ile	Glu	Asn	Asn	Thr	Asp	Glu	Leu
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Lys	Phe	Ser	Asn	Cys	Val	Glu	Glu	Glu	Ile	Tyr	Pro	Asn	Asn	Thr	Val
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Thr	Cys	Asn	Asp	Tyr	Thr	Val	Asn	Gln	Glu	Glu	Tyr	Gly	Gly	Ala	Tyr
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Ile	Ser	Arg	Leu	Glu	Gly	Leu	Ser	Asn	Leu	Tyr	Gln	Ile	Tyr	Ala	Glu
			100					105					110		
Ser	Phe	Arg	Glu	Trp	Glu	Ala	Asp	Pro	Thr	Asn	Pro	Ala	Leu	Arg	Glu
		115					120					125			
Glu	Met	Arg	Ile	Gln	Phe	Asn	Asp	Met	Asn	Ser	Ala	Leu	Thr	Thr	Ala
	130					135					140				
Ile	Pro	Leu	Phe	Ala	Val	Gln	Asn	Tyr	Gln	Val	Pro	Leu	Leu	Ser	Val
145					150					155				160	
Tyr	Val	Gln	Ala	Ala	Asn	Leu	His	Leu	Ser	Val	Leu	Arg	Asp	Val	Ser
				165					170					175	
Val	Phe	Gly	Gln	Arg	Trp	Gly	Phe	Asp	Ala	Ala	Thr	Ile	Asn	Ser	Arg
			180					185					190		
Tyr	Asn	Asp	Leu	Thr	Arg	Leu	Ile	Gly	Asn	Tyr	Thr	Asp	Tyr	Ala	Val
		195					200					205			
Arg	Trp	Tyr	Asn	Thr	Gly	Leu	Glu	Arg	Val	Trp	Gly	Pro	Asp	Ser	Arg
	210					215					220				
Asp	Trp	Val	Arg	Tyr	Asn	Gln	Phe	Arg	Arg	Glu	Leu	Thr	Leu	Thr	Val
225					230					235				240	
Leu	Asp	Ile	Val	Ala	Leu	Phe	Pro	Asn	Tyr	Asp	Ser	Arg	Arg	Tyr	Pro

Ile	Arg	Thr	Val	Ser	Gln	Leu	Thr	Arg	Glu	Ile	Tyr	Thr	Asn	Pro	Val
			260						265					270	
Leu	Glu	Asn	Phe	Asp	Gly	Ser	Phe	Arg	Gly	Ser	Ala	Gln	Gly	Ile	Glu
		275							280				285		
Arg	Ser	Ile	Arg	Ser	Pro	His	Leu	Met	Asp	Ile	Leu	Asn	Ser	Ile	Thr
	290					295					300				
Ile	Tyr	Thr	Asp	Ala	His	Arg	Gly	Tyr	Tyr	Tyr	Trp	Ser	Gly	His	Gln
305					310					315				320	
Ile	Met	Ala	Ser	Pro	Val	Gly	Phe	Ser	Gly	Pro	Glu	Phe	Thr	Phe	Pro
			325						330					335	
Leu	Tyr	Gly	Thr	Met	Gly	Asn	Ala	Ala	Pro	Gln	Gln	Arg	Ile	Val	Ala
		340						345					350		
Gln	Leu	Gly	Gln	Gly	Val	Tyr	Arg	Thr	Leu	Ser	Ser	Thr	Leu	Tyr	Arg
	355						360					365			
Arg	Pro	Phe	Asn	Ile	Gly	Ile	Asn	Asn	Gln	Gln	Leu	Ser	Val	Leu	Asp
	370					375					380				
Gly	Thr	Glu	Phe	Ala	Tyr	Gly	Thr	Ser	Ser	Asn	Leu	Pro	Ser	Ala	Val
385					390					395				400	
Tyr	Arg	Lys	Ser	Gly	Thr	Val	Asp	Ser	Leu	Asp	Glu	Ile	Pro	Pro	Gln
			405					410					415		
Asn	Asn	Asn	Val	Pro	Pro	Arg	Gln	Gly	Phe	Ser	His	Arg	Leu	Ser	His
			420					425					430		
Val	Ser	Met	Phe	Arg	Ser	Gly	Phe	Ser	Asn	Ser	Ser	Val	Ser	Ile	Ile
	435						440					445			
Arg	Ala	Pro	Met	Phe	Ser	Trp	Ile	His	Arg	Ser	Ala	Glu	Phe	Asn	Asn
	450					455					460				
Ile	Ile	Ala	Ser	Asp	Ser	Ile	Thr	Gln	Ile	Pro	Ala	Val	Lys	Gly	Asn
465					470					475				480	
Phe	Leu	Phe	Asn	Gly	Ser	Val	Ile	Ser	Gly	Pro	Gly	Phe	Thr	Gly	Gly
			485						490					495	
Asp	Leu	Val	Arg	Leu	Asn	Ser	Ser	Gly	Asn	Asn	Ile	Gln	Asn	Arg	Gly
		500						505					510		
Tyr	Ile	Glu	Val	Pro	Ile	His	Phe	Pro	Ser	Thr	Ser	Thr	Arg	Tyr	Arg
	515						520					525			
Val	Arg	Val	Arg	Tyr	Ala	Ser	Val	Thr	Pro	Ile	His	Leu	Asn	Val	Asn
	530					535					540				
Trp	Gly	Asn	Ser	Ser	Ile	Phe	Ser	Asn	Thr	Val	Pro	Ala	Thr	Ala	Thr
545					550					555				560	
Ser	Leu	Asp	Asn	Leu	Gln	Ser	Ser	Asp	Phe	Gly	Tyr	Phe	Glu	Ser	Ala
			565					570					575		
Asn	Ala	Phe	Thr	Ser	Ser	Leu	Gly	Asn	Ile	Val	Gly	Val	Arg	Asn	Phe
			580					585					590		
Ser	Gly	Thr	Ala	Gly	Val	Ile	Ile	Asp	Arg	Phe	Glu	Phe	Ile	Pro	Val
	595						600					605			
Thr	Ala	Thr	Leu	Glu	Ala	Glu	Tyr	Asn	Leu	Glu	Arg	Ala	Gln	Lys	Ala
	610					615					620				
Val	Asn	Ala	Leu	Phe	Thr	Ser	Thr	Asn	Gln	Leu	Gly	Leu	Lys	Thr	Asn
625					630					635				640	
Val	Thr	Asp	Tyr	His	Ile	Asp	Gln	Val	Ser	Asn	Leu	Val	Thr	Tyr	Leu
			645					650					655		
Ser	Asp	Glu	Phe	Cys	Leu	Asp	Glu	Lys	Arg	Glu	Leu	Ser	Glu	Lys	Val
		660						665					670		
Lys	His	Ala	Lys	Arg	Leu	Ser	Asp	Glu	Arg	Asn	Leu	Leu	Gln	Asp	Ser
	675						680						685		
Asn	Phe	Lys	Asp	Ile	Asn	Arg	Gln	Pro	Glu	Arg	Gly	Trp	Gly	Gly	Ser
	690					695					700				

Thr	Gly	Ile	Thr	Ile	Gln	Gly	Gly	Asp	Asp	Val	Phe	Lys	Glu	Asn	Tyr
705					710					715				720	
Val	Thr	Leu	Ser	Gly	Thr	Phe	Asp	Glu	Cys	Tyr	Pro	Thr	Tyr	Leu	Tyr
				725					730					735	
Gln	Lys	Ile	Asp	Glu	Ser	Lys	Leu	Lys	Ala	Phe	Thr	Arg	Tyr	Gln	Leu
			740						745					750	
Arg	Gly	Tyr	Ile	Glu	Asp	Ser	Gln	Asp	Leu	Glu	Ile	Tyr	Leu	Ile	Arg
		755							760					765	
Tyr	Asn	Ala	Lys	His	Glu	Thr	Val	Asn	Val	Pro	Gly	Thr	Gly	Ser	Leu
	770								775					780	
Trp	Pro	Leu	Ser	Ala	Gln	Ser	Pro	Ile	Gly	Lys	Cys	Gly	Glu	Pro	Asn
785					790					795					800
Arg	Cys	Ala	Pro	His	Leu	Glu	Trp	Asn	Pro	Asp	Leu	Asp	Cys	Ser	Cys
				805						810					815
Arg	Asp	Gly	Glu	Lys	Cys	Ala	His	His	Ser	His	His	Phe	Ser	Leu	Asp
			820							825				830	
Ile	Asp	Val	Gly	Cys	Thr	Asp	Leu	Asn	Glu	Asp	Leu	Gly	Val	Trp	Val
	835								840					845	
Ile	Phe	Lys	Ile	Lys	Thr	Gln	Asp	Gly	His	Ala	Arg	Leu	Gly	Asn	Leu
	850								855					860	
Glu	Phe	Leu	Glu	Glu	Lys	Pro	Leu	Val	Gly	Glu	Ala	Leu	Ala	Arg	Val
865					870					875					880
Lys	Arg	Ala	Glu	Lys	Lys	Trp	Arg	Asp	Lys	Arg	Glu	Lys	Leu	Glu	Trp
				885						890					895
Glu	Thr	Asn	Ile	Val	Tyr	Lys	Glu	Ala	Lys	Glu	Ser	Val	Asp	Ala	Leu
			900						905					910	
Phe	Val	Asn	Ser	Gln	Tyr	Asp	Gln	Leu	Gln	Ala	Asp	Thr	Asn	Ile	Ala
		915							920					925	
Met	Ile	His	Ala	Ala	Asp	Lys	Arg	Val	His	Ser	Ile	Arg	Glu	Ala	Tyr
	930								935					940	
Leu	Pro	Glu	Leu	Ser	Val	Ile	Pro	Gly	Val	Asn	Ala	Ala	Ile	Phe	Glu
945						950					955				960
Glu	Leu	Glu	Gly	Arg	Ile	Phe	Thr	Ala	Phe	Ser	Leu	Tyr	Asp	Ala	Arg
				965						970					975
Asn	Val	Ile	Lys	Asn	Gly	Asp	Phe	Asn	Asn	Gly	Leu	Ser	Cys	Trp	Asn
			980							985				990	
Val	Lys	Gly	His	Val	Asp	Val	Glu	Glu	Gln	Asn	Asn	Gln	Arg	Ser	Val
		995							1000					1005	
Leu	Val	Val	Pro	Glu	Trp	Glu	Ala	Glu	Val	Ser	Gln	Glu	Val	Arg	Val
	1010								1015					1020	
Cys	Pro	Gly	Arg	Gly	Tyr	Ile	Leu	Arg	Val	Thr	Ala	Tyr	Lys	Glu	Gly
1025					1030					1035					1040
Tyr	Gly	Glu	Gly	Cys	Val	Thr	Ile	His	Glu	Ile	Glu	Asn	Asn	Thr	Asp
				1045						1050					1055
Glu	Leu	Lys	Phe	Ser	Asn	Cys	Val	Glu	Glu	Glu	Ile	Tyr	Pro	Asn	Asn
			1060							1065				1070	
Thr	Val	Thr	Cys	Asn	Asp	Tyr	Thr	Val	Asn	Gln	Glu	Glu	Tyr	Gly	Gly
		1075								1080				1085	
Ala	Tyr	Thr	Ser	Arg	Asn	Arg	Gly	Tyr	Asn	Glu	Ala	Pro	Ser	Val	Pro
	1090									1095				1100	
Ala	Asp	Tyr	Ala	Ser	Val	Tyr	Glu	Glu	Lys	Ser	Tyr	Thr	Asp	Gly	Arg
1105						1110					1115				1120
Arg	Glu	Asn	Pro	Cys	Glu	Phe	Asn	Arg	Gly	Tyr	Arg	Asp	Tyr	Thr	Pro
				1125						1130					1135
Leu	Pro	Val	Gly	Tyr	Val	Thr	Lys	Glu	Leu	Glu	Tyr	Phe	Pro	Glu	Thr
			1140							1145				1150	
Asp	Lys	Val	Trp	Ile	Glu	Ile	Gly	Glu	Thr	Glu	Gly	Thr	Phe	Ile	Val

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Asp Ser Val Glu Leu Leu Leu Met Glu Glu		
1170	1175	

<210> 5  
 <211> 719  
 <212> PRT  
 <213> *Bacillus thuringiensis*

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 Lys Val Asp Lys Ile Ser Thr Asp Ser Leu Lys Asn Glu Thr Asp Ile  
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 Glu Leu Gln Asn Ile Asn His Glu Asp Cys Leu Lys Met Ser Glu Tyr  
 35 40 45  
 Glu Asn Val Glu Pro Phe Val Ser Ala Ser Thr Ile Gln Thr Gly Ile  
 50 55 60  
 Gly Ile Ala Gly Lys Ile Leu Gly Thr Leu Gly Val Pro Phe Ala Gly  
 65 70 75 80  
 Gln Val Ala Ser Leu Tyr Ser Phe Ile Leu Gly Glu Leu Trp Pro Lys  
 85 90 95  
 Gly Lys Asn Gln Trp Glu Ile Phe Met Glu His Val Glu Glu Ile Ile  
 100 105 110  
 Asn Gln Lys Ile Ser Thr Tyr Ala Arg Asn Lys Ala Leu Thr Asp Leu  
 115 120 125  
 Lys Gly Leu Gly Asp Ala Leu Ala Val Tyr His Asp Ser Leu Glu Ser  
 130 135 140  
 Trp Val Gly Asn Arg Asn Asn Thr Arg Ala Arg Ser Val Val Lys Ser  
 145 150 155 160  
 Gln Tyr Ile Ala Leu Glu Leu Met Phe Val Gln Lys Leu Pro Ser Phe  
 165 170 175  
 Ala Val Ser Gly Glu Glu Val Pro Leu Leu Pro Ile Tyr Ala Gln Ala  
 180 185 190  
 Ala Asn Leu His Leu Leu Leu Leu Arg Asp Ala Ser Ile Phe Gly Lys  
 195 200 205  
 Glu Trp Gly Leu Ser Ser Ser Glu Ile Ser Thr Phe Tyr Asn Arg Gln  
 210 215 220  
 Val Glu Arg Ala Gly Asp Tyr Ser Asp His Cys Val Lys Trp Tyr Ser  
 225 230 235 240  
 Thr Gly Leu Asn Asn Leu Arg Gly Thr Asn Ala Glu Ser Trp Val Arg  
 245 250 255  
 Tyr Asn Gln Phe Arg Arg Asp Met Thr Leu Met Val Leu Asp Leu Val  
 260 265 270  
 Ala Leu Phe Pro Ser Tyr Asp Thr Gln Met Tyr Pro Ile Lys Thr Thr  
 275 280 285  
 Ala Gln Leu Thr Arg Glu Val Tyr Thr Asp Ala Ile Gly Thr Val His  
 290 295 300  
 Pro His Pro Ser Phe Thr Ser Thr Thr Trp Tyr Asn Asn Asn Ala Pro  
 305 310 315 320  
 Ser Phe Ser Ala Ile Glu Ala Ala Val Val Arg Asn Pro His Leu Leu  
 325 330 335  
 Asp Phe Leu Glu Gln Val Thr Ile Tyr Ser Leu Leu Ser Arg Trp Ser  
 340 345 350  
 Asn Thr Gln Tyr Met Asn Met Trp Gly Gly His Lys Leu Glu Phe Arg  
 355 360 365

Thr Ile Gly Gly Thr Leu Asn Ile Ser Thr Gln Gly Ser Thr Asn Thr  
 370 375 380  
 Ser Ile Asn Pro Val Thr Leu Pro Phe Thr Ser Arg Asp Val Tyr Arg  
 385 390 395 400  
 Thr Glu Ser Leu Ala Gly Leu Asn Leu Phe Leu Thr Gln Pro Val Asn  
 405 410 415  
 Gly Val Pro Arg Val Asp Phe His Trp Lys Phe Val Thr His Pro Ile  
 420 425 430  
 Ala Ser Asp Asn Phe Tyr Tyr Pro Gly Tyr Ala Gly Ile Gly Thr Gln  
 435 440 445  
 Leu Gln Asp Ser Glu Asn Glu Leu Pro Pro Glu Ala Thr Gly Gln Pro  
 450 455 460  
 Asn Tyr Glu Ser Tyr Ser His Arg Leu Ser His Ile Gly Leu Ile Ser  
 465 470 475 480  
 Ala Ser His Val Lys Ala Leu Val Tyr Ser Trp Thr His Arg Ser Ala  
 485 490 495  
 Asp Arg Thr Asn Thr Ile Glu Pro Asn Ser Ile Thr Gln Ile Pro Leu  
 500 505 510  
 Val Lys Ala Phe Asn Leu Ser Ser Gly Ala Ala Val Val Arg Gly Pro  
 515 520 525  
 Gly Phe Thr Gly Gly Asp Ile Leu Arg Arg Thr Asn Thr Gly Thr Phe  
 530 535 540  
 Gly Asp Ile Arg Val Asn Ile Asn Pro Pro Phe Ala Gln Arg Tyr Arg  
 545 550 555 560  
 Val Arg Ile Arg Tyr Ala Ser Thr Thr Asp Leu Gln Phe His Thr Ser  
 565 570 575  
 Ile Asn Gly Lys Ala Ile Asn Gln Gly Asn Phe Ser Ala Thr Met Asn  
 580 585 590  
 Arg Gly Glu Asp Leu Asp Tyr Lys Thr Phe Arg Thr Val Gly Phe Thr  
 595 600 605  
 Thr Pro Phe Ser Phe Leu Asp Val Gln Ser Thr Phe Thr Ile Gly Ala  
 610 615 620  
 Trp Asn Phe Ser Ser Gly Asn Glu Val Tyr Ile Asp Arg Ile Glu Phe  
 625 630 635 640  
 Val Pro Val Glu Val Thr Tyr Glu Ala Glu Tyr Asp Phe Glu Lys Ala  
 645 650 655  
 Gln Glu Lys Val Thr Ala Leu Phe Thr Ser Thr Asn Pro Arg Gly Leu  
 660 665 670  
 Lys Thr Asp Val Lys Asp Tyr His Ile Asp Gln Val Ser Asn Leu Val  
 675 680 685  
 Glu Ser Leu Ser Asp Glu Phe Tyr Leu Asp Glu Lys Arg Glu Leu Phe  
 690 695 700  
 Glu Ile Val Lys Tyr Ala Lys Gln Leu His Ile Glu Arg Asn Met  
 705 710 715

<210> 6

<211> 652

<212> PRT

<213> *Bacillus thuringiensis*

<400> 6

Met Ile Arg Lys Gly Gly Arg Lys Met Asn Pro Asn Asn Arg Ser Glu  
 1 5 10 15  
 His Asp Thr Ile Lys Thr Thr Glu Asn Asn Glu Val Pro Thr Asn His  
 20 25 30  
 Val Gln Tyr Pro Leu Ala Glu Thr Pro Asn Pro Thr Leu Glu Asp Leu

RTA01/2150162v1

Pro	Val	Leu	Thr	Trp	Thr	His	Lys	Ser	Val	Asp	Phe	Phe	Asn	Met	Ile
		500						505					510		
Asp	Ser	Lys	Lys	Ile	Thr	Gln	Leu	Pro	Leu	Val	Lys	Ala	Tyr	Lys	Leu
		515					520					525			
Gln	Ser	Gly	Ala	Ser	Val	Val	Ala	Gly	Pro	Arg	Phe	Thr	Gly	Gly	Asp
		530				535					540				
Ile	Ile	Gln	Cys	Thr	Glu	Asn	Gly	Ser	Ala	Ala	Thr	Ile	Tyr	Val	Thr
545					550					555					560
Pro	Asp	Val	Ser	Tyr	Ser	Gln	Lys	Tyr	Arg	Ala	Arg	Ile	His	Tyr	Ala
				565					570					575	
Ser	Thr	Ser	Gln	Ile	Thr	Phe	Thr	Leu	Ser	Leu	Asp	Gly	Ala	Pro	Phe
			580					585					590		
Asn	Gln	Tyr	Tyr	Phe	Asp	Lys	Thr	Ile	Asn	Lys	Gly	Asp	Thr	Leu	Thr
		595					600					605			
Tyr	Asn	Ser	Phe	Asn	Leu	Ala	Ser	Phe	Ser	Thr	Pro	Phe	Glu	Leu	Ser
	610					615					620				
Gly	Asn	Asn	Leu	Gln	Ile	Gly	Val	Thr	Gly	Leu	Ser	Ala	Gly	Asp	Lys
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Val	Tyr	Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Val	Asn				
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<210> 7

<211> 659

<212> PRT

<213> Bacillus thuringiensis

<400> 7

Met	Ile	Arg	Met	Gly	Gly	Arg	Lys	Met	Asn	Pro	Asn	Asn	Arg	Ser	Glu
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Tyr	Asp	Thr	Ile	Lys	Val	Thr	Pro	Asn	Ser	Glu	Leu	Pro	Thr	Asn	His
			20					25					30		
Asn	Gln	Tyr	Pro	Leu	Ala	Asp	Asn	Pro	Asn	Ser	Thr	Leu	Glu	Glu	Leu
		35					40					45			
Asn	Tyr	Lys	Glu	Phe	Leu	Arg	Met	Thr	Ala	Asp	Asn	Ser	Thr	Glu	Val
	50					55				60					
Leu	Asp	Ser	Ser	Thr	Val	Lys	Asp	Ala	Val	Gly	Thr	Gly	Ile	Ser	Val
65					70					75				80	
Val	Gly	Gln	Ile	Leu	Gly	Val	Val	Gly	Val	Pro	Phe	Ala	Gly	Ala	Leu
			85					90					95		
Thr	Ser	Phe	Tyr	Gln	Ser	Phe	Leu	Asn	Ala	Ile	Trp	Pro	Ser	Asp	Ala
			100					105					110		
Asp	Pro	Trp	Lys	Ala	Phe	Met	Ala	Gln	Val	Glu	Val	Leu	Ile	Asp	Lys
		115					120					125			
Lys	Ile	Glu	Glu	Tyr	Ala	Lys	Ser	Lys	Ala	Leu	Ala	Glu	Leu	Gln	Gly
	130					135					140				
Leu	Gln	Asn	Asn	Phe	Glu	Asp	Tyr	Val	Asn	Ala	Leu	Asp	Ser	Trp	Lys
145					150					155					160
Lys	Ala	Pro	Val	Asn	Leu	Arg	Ser	Arg	Arg	Ser	Gln	Asp	Arg	Ile	Arg
				165				170						175	
Glu	Leu	Phe	Ser	Gln	Ala	Glu	Ser	His	Phe	Arg	Asn	Ser	Met	Pro	Ser
			180					185					190		
Phe	Ala	Val	Ser	Lys	Phe	Glu	Val	Leu	Phe	Leu	Pro	Thr	Tyr	Ala	Gln
		195					200					205			
Ala	Ala	Asn	Thr	His	Leu	Leu	Leu	Leu	Lys	Asp	Ala	Gln	Val	Phe	Gly
	210					215					220				
Glu	Glu	Trp	Gly	Tyr	Ser	Ser	Glu	Asp	Ile	Ala	Glu	Phe	Tyr	Gln	Arg

225					230					235				240
Gln	Leu	Lys	Leu	Thr	Gln	Gln	Tyr	Thr	Asp	His	Cys	Val	Asn	Trp
					245				250				255	
Asn	Val	Gly	Leu	Asn	Ser	Leu	Arg	Gly	Ser	Thr	Tyr	Asp	Ala	Trp
					260				265				270	
Lys	Phe	Asn	Arg	Phe	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu	Asp
					275				280				285	
Ile	Val	Leu	Phe	Pro	Phe	Tyr	Asp	Val	Arg	Leu	Tyr	Ser	Lys	Gly
					290				295				300	
Lys	Thr	Glu	Leu	Thr	Arg	Asp	Ile	Phe	Thr	Asp	Pro	Ile	Phe	Thr
					305				310				315	
Asn	Ala	Leu	Gln	Glu	Tyr	Gly	Pro	Thr	Phe	Ser	Ser	Ile	Glu	Asn
					325				330				335	
Ile	Arg	Lys	Pro	His	Leu	Phe	Asp	Tyr	Leu	Arg	Gly	Ile	Glu	Phe
					340				345				350	
Thr	Arg	Leu	Arg	Pro	Gly	Tyr	Ser	Gly	Lys	Asp	Ser	Phe	Asn	Tyr
					355				360				365	
Ser	Gly	Asn	Tyr	Val	Glu	Thr	Arg	Pro	Ser	Ile	Gly	Ser	Asn	Asp
					370				375				380	
Ile	Thr	Ser	Pro	Phe	Tyr	Gly	Asp	Lys	Ser	Ile	Glu	Pro	Ile	Gln
					385				390				395	
Leu	Ser	Phe	Asp	Gly	Gln	Lys	Val	Tyr	Arg	Thr	Ile	Ala	Asn	Thr
					405				410				415	
Ile	Ala	Ala	Phe	Pro	Asp	Gly	Lys	Ile	Tyr	Phe	Gly	Val	Thr	Lys
					420				425				430	
Asp	Phe	Ser	Gln	Tyr	Asp	Asp	Gln	Lys	Asn	Glu	Thr	Ser	Thr	Gln
					435				440				445	
Tyr	Asp	Ser	Lys	Arg	Tyr	Asn	Gly	Tyr	Leu	Gly	Ala	Gln	Asp	Ser
					450				455				460	
Asp	Gln	Leu	Pro	Pro	Glu	Thr	Thr	Asp	Glu	Pro	Leu	Glu	Lys	Ala
					465				470				475	
Ser	His	Gln	Leu	Asn	Tyr	Ala	Glu	Cys	Phe	Leu	Met	Gln	Asp	Arg
					485				490				495	
Gly	Thr	Ile	Pro	Phe	Phe	Thr	Trp	Thr	His	Arg	Ser	Val	Asp	Phe
					500				505				510	
Asn	Thr	Ile	Asp	Ala	Glu	Lys	Ile	Thr	Gln	Leu	Pro	Val	Val	Lys
					515				520				525	
Tyr	Ala	Leu	Ser	Ser	Gly	Ala	Ser	Ile	Ile	Glu	Gly	Pro	Gly	Phe
					530				535				540	
Gly	Gly	Asn	Leu	Leu	Phe	Leu	Lys	Glu	Ser	Ser	Asn	Ser	Ile	Ala
					545				550				555	
Phe	Lys	Val	Thr	Leu	Asn	Ser	Ala	Ala	Leu	Leu	Gln	Arg	Tyr	Arg
					565				570				575	
Arg	Ile	Arg	Tyr	Ala	Ser	Thr	Thr	Asn	Leu	Arg	Leu	Phe	Val	Gln
					580				585				590	
Ser	Asn	Asn	Asp	Phe	Leu	Val	Ile	Tyr	Ile	Asn	Lys	Thr	Met	Asn
					595				600				605	
Asp	Gly	Asp	Leu	Thr	Tyr	Gln	Thr	Phe	Asp	Phe	Ala	Thr	Ser	Asn
					610				615				620	
Asn	Met	Gly	Phe	Ser	Gly	Asp	Thr	Asn	Asp	Phe	Ile	Ile	Gly	Ala
					625				630				635	
Ser	Phe	Val	Ser	Asn	Glu	Lys	Ile	Tyr	Ile	Asp	Lys	Ile	Glu	Phe
					645				650				655	
Pro	Val	Gln												



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 <211> 1180  
 <212> PRT  
 <213> *Bacillus thuringiensis*

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 Asn Ser Pro Lys Gln Leu Leu Gln Ser Thr Asn Tyr Lys Asp Trp Leu  
 35 40 45  
 Asn Met Cys Gln Gln Asn Gln Tyr Gly Gly Asp Phe Glu Thr Phe  
 50 55 60  
 Ile Asp Ser Gly Glu Leu Ser Ala Tyr Thr Ile Val Val Gly Thr Val  
 65 70 75 80  
 Leu Thr Gly Phe Gly Phe Thr Thr Pro Leu Gly Leu Ala Leu Ile Gly  
 85 90 95  
 Phe Gly Thr Leu Ile Pro Val Leu Phe Pro Ala Gln Asp Gln Ser Asn  
 100 105 110  
 Thr Trp Ser Asp Phe Ile Thr Gln Thr Lys Asn Ile Ile Lys Lys Glu  
 115 120 125  
 Ile Ala Ser Thr Tyr Ile Ser Asn Ala Asn Lys Ile Leu Asn Arg Ser  
 130 135 140  
 Phe Asn Val Ile Ser Thr Tyr His Asn His Leu Lys Thr Trp Glu Asn  
 145 150 155 160  
 Asn Pro Asn Pro Gln Asn Thr Gln Asp Val Arg Thr Gln Ile Gln Leu  
 165 170 175  
 Val His Tyr His Phe Gln Asn Val Ile Pro Glu Leu Val Asn Ser Cys  
 180 185 190  
 Pro Pro Asn Pro Ser Asp Cys Asp Tyr Tyr Asn Ile Leu Val Leu Ser  
 195 200 205  
 Ser Tyr Ala Gln Ala Ala Asn Leu His Leu Thr Val Leu Asn Gln Ala  
 210 215 220  
 Val Lys Phe Glu Ala Tyr Leu Lys Asn Asn Arg Gln Phe Asp Tyr Leu  
 225 230 235 240  
 Glu Pro Leu Pro Thr Ala Ile Asp Tyr Tyr Pro Val Leu Thr Lys Ala  
 245 250 255  
 Ile Glu Asp Tyr Thr Asn Tyr Cys Val Thr Thr Tyr Lys Lys Gly Leu  
 260 265 270  
 Asn Leu Ile Lys Thr Thr Pro Asp Ser Asn Leu Asp Gly Asn Ile Asn  
 275 280 285  
 Trp Asn Thr Tyr Asn Thr Tyr Arg Thr Lys Met Thr Thr Ala Val Leu  
 290 295 300  
 Asp Leu Val Ala Leu Phe Pro Asn Tyr Asp Val Gly Lys Tyr Pro Ile  
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 Gly Val Gln Ser Glu Leu Thr Arg Glu Ile Tyr Gln Val Leu Asn Phe  
 325 330 335  
 Glu Glu Ser Pro Tyr Lys Tyr Tyr Asp Phe Gln Tyr Gln Glu Asp Ser  
 340 345 350  
 Leu Thr Arg Arg Pro His Leu Phe Thr Trp Leu Asp Ser Leu Asn Phe  
 355 360 365  
 Tyr Glu Lys Ala Gln Thr Thr Pro Asn Asn Phe Phe Thr Ser His Tyr  
 370 375 380  
 Asn Met Phe His Tyr Thr Leu Asp Asn Ile Ser Gln Lys Ser Ser Val  
 385 390 395 400  
 Phe Gly Asn His Asn Val Thr Asp Lys Leu Lys Ser Leu Gly Leu Ala

Thr	Asn	Ile	Tyr	Ile	Phe	Leu	Leu	Asn	Val	Ile	Ser	Leu	Asp	Asn	Lys
			420						425					430	
Tyr	Leu	Asn	Asp	Tyr	Asn	Asn	Ile	Ser	Lys	Met	Asp	Phe	Phe	Ile	Thr
		435							440				445		
Asn	Gly	Thr	Arg	Leu	Leu	Glu	Lys	Glu	Leu	Thr	Ala	Gly	Ser	Gly	Gln
	450					455					460				
Ile	Thr	Tyr	Asp	Val	Asn	Lys	Asn	Ile	Phe	Gly	Leu	Pro	Ile	Leu	Lys
465					470					475					480
Arg	Arg	Glu	Asn	Gln	Gly	Asn	Pro	Thr	Leu	Phe	Pro	Thr	Tyr	Asp	Asn
			485						490					495	
Tyr	Ser	His	Ile	Leu	Ser	Phe	Ile	Lys	Ser	Leu	Ser	Ile	Pro	Ala	Thr
			500						505				510		
Tyr	Lys	Thr	Gln	Val	Tyr	Thr	Phe	Ala	Trp	Thr	His	Ser	Ser	Val	Asp
		515					520					525			
Pro	Lys	Asn	Thr	Ile	Tyr	Thr	His	Leu	Thr	Thr	Gln	Ile	Pro	Ala	Val
	530					535					540				
Lys	Ala	Asn	Ser	Leu	Gly	Thr	Ala	Ser	Lys	Val	Val	Gln	Gly	Pro	Gly
545					550					555					560
His	Thr	Gly	Gly	Asp	Leu	Ile	Asp	Phe	Lys	Asp	His	Phe	Lys	Ile	Thr
			565					570						575	
Cys	Gln	His	Ser	Asn	Phe	Gln	Gln	Ser	Tyr	Phe	Ile	Arg	Ile	Arg	Tyr
			580					585					590		
Ala	Ser	Asn	Gly	Ser	Ala	Asn	Thr	Arg	Ala	Val	Ile	Asn	Leu	Ser	Ile
		595					600					605			
Pro	Gly	Val	Ala	Glu	Leu	Gly	Met	Ala	Leu	Asn	Pro	Thr	Phe	Ser	Gly
	610					615					620				
Thr	Asp	Tyr	Thr	Asn	Leu	Lys	Tyr	Lys	Asp	Phe	Gln	Tyr	Leu	Glu	Phe
625					630					635					640
Ser	Asn	Glu	Val	Lys	Phe	Ala	Pro	Asn	Gln	Asn	Ile	Ser	Leu	Val	Phe
			645						650					655	
Asn	Arg	Ser	Asp	Val	Tyr	Thr	Asn	Thr	Val	Leu	Ile	Asp	Lys	Ile	
			660					665					670		
Glu	Phe	Leu	Pro	Ile	Thr	Arg	Ser	Ile	Arg	Glu	Asp	Arg	Glu	Lys	Gln
		675					680					685			
Lys	Leu	Glu	Thr	Val	Gln	Gln	Ile	Ile	Asn	Thr	Phe	Tyr	Ala	Asn	Pro
	690					695				700					
Ile	Lys	Asn	Thr	Leu	Gln	Ser	Glu	Leu	Thr	Asp	Tyr	Asp	Ile	Asp	Gln
705					710					715					720
Ala	Ala	Asn	Leu	Val	Glu	Cys	Ile	Ser	Glu	Glu	Leu	Tyr	Pro	Lys	Glu
			725						730					735	
Lys	Met	Leu	Leu	Leu	Asp	Glu	Val	Lys	Asn	Ala	Lys	Gln	Leu	Ser	Gln
		740						745					750		
Ser	Arg	Asn	Val	Leu	Gln	Asn	Gly	Asp	Phe	Glu	Ser	Ala	Thr	Leu	Gly
		755					760					765			
Trp	Thr	Thr	Ser	Asp	Asn	Ile	Thr	Ile	Gln	Glu	Asp	Asp	Pro	Ile	Phe
	770					775						780			
Lys	Gly	His	Tyr	Leu	His	Met	Ser	Gly	Ala	Arg	Asp	Ile	Asp	Gly	Thr
785					790					795					800
Ile	Phe	Pro	Thr	Tyr	Ile	Phe	Gln	Lys	Ile	Asp	Glu	Ser	Lys	Leu	Lys
			805						810					815	
Pro	Tyr	Thr	Arg	Tyr	Leu	Val	Arg	Gly	Phe	Val	Gly	Ser	Ser	Lys	Asp
			820					825					830		
Val	Glu	Leu	Val	Val	Ser	Arg	Tyr	Gly	Glu	Glu	Ile	Asp	Ala	Ile	Met
		835					840					845			
Asn	Val	Pro	Ala	Asp	Leu	Asn	Tyr	Leu	Tyr	Pro	Ser	Thr	Phe	Asp	Cys
	850					855					860				

Glu	Gly	Ser	Asn	Arg	Cys	Glu	Thr	Ser	Ala	Val	Pro	Ala	Asn	Ile	Gly	865					870					875						880
Asn	Thr	Ser	Asp	Met	Leu	Tyr	Ser	Cys	Gln	Tyr	Asp	Thr	Gly	Lys	Lys						885										895	
His	Val	Val	Cys	Gln	Asp	Ser	His	Gln	Phe	Ser	Phe	Thr	Ile	Asp	Thr						900										910	
Gly	Ala	Leu	Asp	Thr	Asn	Glu	Asn	Ile	Gly	Val	Trp	Val	Met	Phe	Lys						915										925	
Ile	Ser	Ser	Pro	Asp	Gly	Tyr	Ala	Ser	Leu	Asp	Asn	Leu	Glu	Val	Ile						930										940	
Glu	Glu	Gly	Pro	Ile	Asp	Gly	Glu	Ala	Leu	Ser	Arg	Val	Lys	His	Met						945										960	
Glu	Lys	Lys	Trp	Asn	Asp	Gln	Met	Glu	Ala	Lys	Arg	Ser	Glu	Thr	Gln						950										975	
Gln	Ala	Tyr	Asp	Val	Ala	Lys	Gln	Ala	Ile	Asp	Ala	Leu	Phe	Thr	Asn						965										990	
Val	Gln	Asp	Glu	Ala	Leu	Gln	Phe	Asp	Thr	Thr	Leu	Ala	Gln	Ile	Gln						980										1005	
Tyr	Ala	Glu	Tyr	Leu	Val	Gln	Ser	Ile	Pro	Tyr	Val	Tyr	Asn	Asp	Trp						995										1020	
Leu	Ser	Asp	Val	Pro	Gly	Met	Asn	Tyr	Asp	Ile	Tyr	Val	Glu	Leu	Asp						1010										1040	
Ala	Arg	Val	Ala	Gln	Ala	Arg	Tyr	Leu	Tyr	Asp	Thr	Arg	Asn	Ile	Ile						1025										1055	
Lys	Asn	Gly	Asp	Phe	Thr	Gln	Gly	Val	Met	Gly	Trp	His	Val	Thr	Gly						1030										1070	
Asn	Ala	Asp	Val	Gln	Gln	Ile	Asp	Gly	Val	Ser	Val	Leu	Val	Leu	Ser						1045										1085	
Asn	Trp	Ser	Ala	Gly	Val	Ser	Gln	Asn	Val	His	Leu	Gln	His	Asn	His						1060										1100	
Gly	Tyr	Val	Leu	Arg	Val	Ile	Ala	Lys	Lys	Glu	Gly	Pro	Gly	Asn	Gly						1075										1120	
Tyr	Val	Thr	Leu	Met	Asp	Cys	Glu	Glu	Asn	Gln	Glu	Lys	Leu	Thr	Phe						1090										1135	
Thr	Ser	Cys	Glu	Glu	Gly	Tyr	Ile	Thr	Lys	Thr	Val	Asp	Val	Phe	Pro						1095										1150	
Asp	Thr	Asp	Arg	Val	Arg	Ile	Glu	Ile	Gly	Glu	Thr	Glu	Gly	Ser	Phe						1110										1165	
Tyr	Ile	Glu	Ser	Ile	Glu	Leu	Ile	Cys	Met	Asn	Glu										1125										1180	

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<212> PRT

<213> *Bacillus thuringiensis*

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Asn	Gly	Asn	Gln	Phe	Ile	Ile	Ser	Lys	Gln	Glu	Trp	Ala	Thr	Ile	Gly																			
Ala	Tyr	Ile	Gln	Thr	Gly	Leu	Gly	Leu	Pro	Val	Asn	Glu	Gln	Gln	Leu																			
Arg	Thr	His	Val	Asn	Leu	Ser	Gln	Asp	Ile	Ser	Ile	Pro	Ser	Asp	Phe																			

65					70					75				80	
Ser	Gln	Leu	Tyr	Asp	Val	Tyr	Cys	Ser	Asp	Lys	Thr	Ser	Ala	Glu	Trp
				85					90					95	
Trp	Asn	Lys	Asn	Leu	Tyr	Pro	Leu	Ile	Ile	Lys	Ser	Ala	Asn	Asp	Ile
			100					105					110		
Ala	Ser	Tyr	Gly	Phe	Lys	Val	Ala	Gly	Asp	Pro	Ser	Ile	Lys	Lys	Asp
		115					120					125			
Gly	Tyr	Phe	Lys	Lys	Leu	Gln	Asp	Glu	Leu	Asp	Asn	Ile	Val	Asp	Asn
	130					135					140				
Asn	Ser	Asp	Asp	Asp	Ala	Ile	Ala	Lys	Ala	Ile	Lys	Asp	Phe	Lys	Ala
145					150					155					160
Arg	Cys	Gly	Ile	Leu	Ile	Lys	Glu	Ala	Lys	Gln	Tyr	Glu	Glu	Ala	Ala
			165					170					175		
Lys	Asn	Ile	Val	Thr	Ser	Leu	Asp	Gln	Phe	Leu	His	Gly	Asp	Gln	Lys
			180					185					190		
Lys	Leu	Glu	Gly	Val	Ile	Asn	Ile	Gln	Lys	Arg	Leu	Lys	Glu	Val	Gln
		195					200					205			
Thr	Ala	Leu	Asn	Gln	Ala	His	Gly	Glu	Ser	Ser	Pro	Ala	His	Lys	Glu
	210					215					220				
Leu	Leu	Glu	Lys	Val	Lys	Asn	Leu	Lys	Thr	Thr	Leu	Glu	Arg	Thr	Ile
225					230					235					240
Lys	Ala	Glu	Gln	Asp	Leu	Glu	Lys	Lys	Val	Glu	Tyr	Ser	Phe	Leu	Leu
			245					250					255		
Gly	Pro	Leu	Leu	Gly	Phe	Val	Val	Tyr	Glu	Ile	Leu	Glu	Asn	Thr	Ala
		260					265					270			
Val	Gln	His	Ile	Lys	Asn	Gln	Ile	Asp	Glu	Ile	Lys	Lys	Gln	Leu	Asp
	275					280					285				
Ser	Ala	Gln	His	Asp	Leu	Asp	Arg	Asp	Val	Lys	Ile	Ile	Gly	Met	Leu
	290				295					300					
Asn	Ser	Ile	Asn	Thr	Asp	Ile	Asp	Asn	Leu	Tyr	Ser	Gln	Gly	Gln	Glu
305				310					315						320
Ala	Ile	Lys	Val	Phe	Gln	Lys	Leu	Gln	Gly	Ile	Trp	Ala	Thr	Ile	Gly
			325					330					335		
Ala	Gln	Ile	Glu	Asn	Leu	Arg	Thr	Thr	Ser	Leu	Gln	Glu	Val	Gln	Asp
		340					345					350			
Ser	Asp	Asp	Ala	Asp	Glu	Ile	Gln	Ile	Glu	Leu	Glu	Asp	Ala	Ser	Asp
	355						360					365			
Ala	Trp	Leu	Val	Val	Ala	Gln	Glu	Ala	Arg	Asp	Phe	Thr	Leu	Asn	Ala
	370				375					380					
Tyr	Ser	Thr	Asn	Ser	Arg	Gln	Asn	Leu	Pro	Ile	Asn	Val	Ile	Ser	Asp
385				390					395						400
Ser	Cys	Asn	Cys	Ser	Thr	Thr	Asn	Met	Thr	Ser	Asn	Gln	Tyr	Ser	Asn
			405					410					415		
Pro	Thr	Thr	Asn	Met	Thr	Ser	Asn	Gln	Tyr	Met	Ile	Ser	His	Glu	Tyr
		420					425					430			
Thr	Ser	Leu	Pro	Asn	Asn	Phe	Met	Leu	Ser	Arg	Asn	Ser	Asn	Leu	Glu
	435					440					445				
Tyr	Lys	Cys	Pro	Glu	Asn	Asn	Phe	Met	Ile	Tyr	Trp	Tyr	Asn	Asn	Ser
	450				455					460					
Asp	Trp	Tyr	Asn	Asn	Ser	Asp	Trp	Tyr	Asn	Asn					
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 <212> PRT  
 <213> Bacillus thuringiensis

<400> 10

Met	Asn	Leu	Asn	Asn	Leu	Asp	Gly	Tyr	Glu	Asp	Ser	Asn	Arg	Thr	Leu
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Asn	Asn	Ser	Leu	Asn	Tyr	Pro	Thr	Gln	Lys	Ala	Leu	Ser	Pro	Ser	Leu
			20					25					30		
Lys	Asn	Met	Asn	Tyr	Gln	Asp	Phe	Leu	Ser	Ile	Thr	Glu	Arg	Glu	Gln
		35					40					45			
Pro	Glu	Ala	Leu	Ala	Ser	Gly	Asn	Thr	Ala	Ile	Asn	Thr	Val	Val	Ser
	50					55					60				
Val	Thr	Gly	Ala	Thr	Leu	Ser	Ala	Leu	Gly	Val	Pro	Gly	Ala	Ser	Phe
65					70					75					80
Ile	Thr	Asn	Phe	Tyr	Leu	Lys	Ile	Ala	Gly	Leu	Leu	Trp	Pro	Glu	Asn
				85					90					95	
Gly	Lys	Ile	Trp	Asp	Glu	Phe	Met	Thr	Glu	Val	Glu	Ala	Leu	Ile	Asp
			100					105					110		
Gln	Lys	Ile	Glu	Glu	Tyr	Val	Arg	Asn	Lys	Ala	Ile	Ala	Glu	Leu	Asp
		115					120					125			
Gly	Leu	Gly	Ser	Ala	Leu	Asp	Lys	Tyr	Gln	Lys	Ala	Leu	Ala	Asp	Trp
	130					135					140				
Leu	Gly	Lys	Gln	Asp	Asp	Pro	Glu	Ala	Ile	Leu	Ser	Val	Ala	Thr	Glu
145					150					155					160
Phe	Arg	Ile	Ile	Asp	Ser	Leu	Phe	Glu	Phe	Ser	Met	Pro	Ser	Phe	Lys
				165					170					175	
Val	Thr	Gly	Tyr	Glu	Ile	Pro	Leu	Leu	Thr	Val	Tyr	Ala	Gln	Ala	Ala
			180					185					190		
Asn	Leu	His	Leu	Ala	Leu	Leu	Arg	Asp	Ser	Thr	Leu	Tyr	Gly	Asp	Lys
		195					200					205			
Trp	Gly	Phe	Thr	Gln	Asn	Asn	Ile	Glu	Glu	Asn	Tyr	Asn	Arg	Gln	Lys
	210				215						220				
Lys	Arg	Ile	Ser	Glu	Tyr	Ser	Asp	His	Cys	Thr	Lys	Trp	Tyr	Asn	Ser
225					230					235					240
Gly	Leu	Ser	Arg	Leu	Asn	Gly	Ser	Thr	Tyr	Glu	Gln	Trp	Ile	Asn	Tyr
				245					250					255	
Asn	Arg	Phe	Arg	Arg	Glu	Met	Ile	Leu	Met	Ala	Leu	Asp	Leu	Val	Ala
			260					265					270		
Val	Phe	Pro	Phe	His	Asp	Pro	Arg	Arg	Tyr	Ser	Met	Glu	Thr	Ser	Thr
		275					280					285			
Gln	Leu	Thr	Arg	Glu	Val	Tyr	Thr	Asp	Pro	Val	Ser	Leu	Ser	Ile	Ser
	290					295					300				
Asn	Pro	Asp	Ile	Gly	Pro	Ser	Phe	Ser	Gln	Met	Glu	Asn	Thr	Ala	Ile
305					310					315					320
Arg	Thr	Pro	His	Leu	Val	Asp	Tyr	Leu	Asp	Glu	Leu	Tyr	Ile	Tyr	Thr
				325					330					335	
Ser	Lys	Tyr	Lys	Ala	Phe	Ser	His	Glu	Ile	Gln	Pro	Asp	Leu	Phe	Tyr
			340					345					350		
Trp	Ser	Ala	His	Lys	Val	Ser	Phe	Lys	Lys	Ser	Glu	Gln	Ser	Asn	Leu
		355					360					365			
Tyr	Thr	Thr	Gly	Ile	Tyr	Gly	Lys	Thr	Ser	Gly	Tyr	Ile	Ser	Ser	Gly
	370					375					380				
Ala	Tyr	Ser	Phe	His	Gly	Asn	Asp	Ile	Tyr	Arg	Thr	Leu	Ala	Ala	Pro
385					390					395					400
Ser	Val	Val	Val	Tyr	Pro	Tyr	Thr	Gln	Asn	Tyr	Gly	Val	Glu	Gln	Val
				405					410					415	
Glu	Phe	Tyr	Gly	Val	Lys	Gly	His	Val	His	Tyr	Arg	Gly	Asp	Asn	Lys
			420					425					430		
Tyr	Asp	Leu	Thr	Tyr	Asp	Ser	Ile	Asp	Gln	Leu	Pro	Pro	Asp	Gly	Glu

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Ile Gly Glu Ala Leu Ala Arg Val Lys Arg Gln Glu Thr Lys Trp Arg  
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 Asn Lys Leu Ala Gln Leu Thr Thr Glu Thr Gln Ala Ile Tyr Thr Arg  
                     915                    920                    925  
 Ala Lys Gln Ala Leu Asp Asn Leu Phe Ala Asn Ala Gln Asp Ser His  
                     930                    935                    940  
 Leu Lys Arg Asp Val Thr Phe Ala Glu Ile Ala Ala Ala Arg Lys Ile  
 945                    950                    955                    960  
 Val Gln Ser Ile Arg Glu Ala Tyr Met Ser Trp Leu Ser Val Val Pro  
                     965                    970                    975  
 Gly Val Asn His Pro Ile Phe Thr Glu Leu Ser Gly Arg Val Gln Arg  
                     980                    985                    990  
 Ala Phe Gln Leu Tyr Asp Val Arg Asn Val Val Arg Asn Gly Arg Phe  
                     995                    1000                    1005  
 Leu Asn Gly Leu Ser Asp Trp Ile Val Thr Ser Asp Val Lys Val Gln  
                     1010                    1015                    1020  
 Glu Glu Asn Gly Asn Asn Val Leu Val Leu Asn Asn Trp Asp Ala Gln  
 1025                    1030                    1035                    1040  
 Val Leu Gln Asn Val Lys Leu Tyr Gln Asp Arg Gly Tyr Ile Leu His  
                     1045                    1050                    1055  
 Val Thr Ala Arg Lys Ile Gly Ile Gly Glu Gly Tyr Ile Thr Ile Thr  
                     1060                    1065                    1070  
 Asp Glu Glu Gly His Thr Asp Gln Leu Arg Phe Thr Ala Cys Glu Glu  
                     1075                    1080                    1085  
 Ile Asp Ala Ser Asn Ala Phe Ile Ser Gly Tyr Ile Thr Lys Glu Leu  
                     1090                    1095                    1100  
 Glu Phe Phe Pro Asp Thr Glu Lys Val His Ile Glu Ile Gly Glu Thr  
 1105                    1110                    1115                    1120  
 Glu Gly Ile Phe Leu Val Glu Ser Ile Glu Leu Phe Leu Met Glu Glu  
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                     20                    25                    30  
 Pro Thr Asp Ala Leu Gln Asn Met Asn Tyr Lys Asp Tyr Leu Lys Met  
                     35                    40                    45  
 Ser Gly Gly Glu Asn Pro Glu Leu Phe Gly Asn Pro Glu Thr Phe Ile  
   50                    55                    60  
 Ser Ser Ser Thr Ile Gln Thr Gly Ile Gly Ile Val Gly Arg Ile Leu  
 65                    70                    75                    80  
 Gly Ala Leu Gly Val Pro Phe Ala Ser Gln Ile Ala Ser Phe Tyr Ser  
                     85                    90                    95  
 Phe Ile Val Gly Gln Leu Trp Pro Ser Lys Ser Val Asp Ile Trp Gly  
                     100                    105                    110  
 Glu Ile Met Glu Arg Val Glu Glu Leu Val Asp Gln Lys Ile Glu Lys  
                     115                    120                    125  
 Tyr Val Lys Asp Lys Ala Leu Ala Glu Leu Lys Gly Leu Gly Asn Ala

130	135	140
Leu Asp Val Tyr Gln Gln Ser Leu Glu Asp Trp Leu Glu Asn Arg Asn		
145	150	155
Asp Ala Arg Thr Arg Ser Val Val Ser Asn Gln Phe Ile Ala Leu Asp		160
	165	170
Leu Asn Phe Val Ser Ser Ile Pro Ser Phe Ala Val Ser Gly His Glu		175
	180	185
Val Leu Leu Leu Ala Val Tyr Ala Gln Ala Val Asn Leu His Leu Leu		190
	195	200
Leu Leu Arg Asp Ala Ser Ile Phe Gly Glu Glu Trp Gly Phe Thr Pro		205
	210	215
Gly Glu Ile Ser Arg Phe Tyr Asn Arg Gln Val Gln Leu Thr Ala Glu		220
225	230	235
Tyr Ser Asp Tyr Cys Val Lys Trp Tyr Lys Ile Gly Leu Asp Lys Leu		240
	245	250
Lys Gly Thr Thr Ser Lys Ser Trp Leu Asn Tyr His Gln Phe Arg Arg		255
	260	265
Glu Met Thr Leu Leu Val Leu Asp Leu Val Ala Leu Phe Pro Asn Tyr		270
	275	280
Asp Thr His Met Tyr Pro Ile Glu Thr Thr Ala Gln Leu Thr Arg Asp		285
	290	295
Val Tyr Thr Asp Pro Ile Ala Phe Asn Ile Val Thr Ser Thr Gly Phe		300
305	310	315
Cys Asn Pro Trp Ser Thr His Ser Gly Ile Leu Phe Tyr Glu Val Glu		320
	325	330
Asn Asn Val Ile Arg Pro Pro His Leu Phe Asp Ile Leu Ser Ser Val		335
	340	345
Glu Ile Asn Thr Ser Arg Gly Gly Ile Thr Leu Asn Asn Asp Ala Tyr		350
	355	360
Ile Asn Tyr Trp Ser Gly His Thr Leu Lys Tyr Arg Arg Thr Ala Asp		365
	370	375
Ser Thr Val Thr Tyr Thr Ala Asn Tyr Gly Arg Ile Thr Ser Glu Lys		380
385	390	395
Asn Ser Phe Ala Leu Glu Asp Arg Asp Ile Phe Glu Ile Asn Ser Thr		400
	405	410
Val Ala Asn Leu Ala Asn Tyr Tyr Gln Lys Ala Tyr Gly Val Pro Gly		415
	420	425
Ser Trp Phe His Met Val Lys Arg Gly Thr Ser Ser Thr Thr Ala Tyr		430
	435	440
Leu Tyr Ser Lys Thr His Thr Ala Leu Gln Gly Cys Thr Gln Val Tyr		445
	450	455
Glu Ser Ser Asp Glu Ile Pro Leu Asp Arg Thr Val Pro Val Ala Glu		460
465	470	475
Ser Tyr Ser His Arg Leu Ser His Ile Thr Ser His Ser Phe Ser Lys		480
	485	490
Asn Gly Ser Ala Tyr Tyr Gly Ser Phe Pro Val Phe Val Trp Thr His		495
	500	505
Thr Ser Ala Asp Leu Asn Asn Thr Ile Tyr Ser Asp Lys Ile Thr Gln		510
	515	520
Ile Pro Ala Val Lys Gly Asp Met Leu Tyr Leu Gly Gly Ser Val Val		525
	530	535
Gln Gly Pro Gly Phe Thr Gly Gly Asp Ile Leu Lys Arg Thr Asn Pro		540
545	550	555
Ser Ile Leu Gly Thr Phe Ala Val Thr Val Asn Gly Ser Leu Ser Gln		560
	565	570
Arg Tyr Arg Val Arg Ile Arg Tyr Ala Ser Thr Thr Asp Phe Glu Phe		575
	580	585
		590



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				1045					1050				1055				
Trp	Asp	Glu	Gln	Val	Ser	Gln	Gln	Phe	Thr	Val	Gln	Pro	Asn	Gln	Arg		
				1060					1065				1070				
Tyr	Val	Leu	Arg	Val	Thr	Ala	Arg	Lys	Glu	Gly	Val	Gly	Asn	Gly	Tyr		
				1075					1080				1085				
Val	Ser	Ile	Arg	Asp	Gly	Gly	Asn	Gln	Ser	Glu	Thr	Leu	Thr	Phe	Ser		
				1090					1095				1100				
Ala	Ser	Asp	Tyr	Asp	Thr	Asn	Gly	Val	Tyr	Asn	Asp	Gln	Thr	Gly	Tyr		
1105						1110					1115				1120		
Ile	Thr	Lys	Thr	Val	Thr	Phe	Ile	Pro	Tyr	Thr	Asp	Gln	Met	Trp	Ile		
				1125						1130					1135		
Glu	Ile	Ser	Glu	Thr	Glu	Gly	Thr	Phe	Tyr	Ile	Glu	Ser	Val	Glu	Leu		
				1140					1145						1150		
Ile	Val	Asp	Val	Glu													
				1155													

<210> 12

<211> 675

<212> PRT

<213> *Bacillus thuringiensis*

<400> 12

Met	Asn	Pro	Tyr	Gln	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Phe	Asn	Ala	Pro		
1				5					10					15			
Ser	Asn	Gly	Phe	Ser	Lys	Ser	Asn	Asn	Tyr	Ser	Arg	Tyr	Pro	Leu	Ala		
			20					25					30				
Asn	Lys	Pro	Asn	Gln	Pro	Leu	Lys	Asn	Thr	Asn	Tyr	Lys	Asp	Trp	Leu		
		35					40					45					
Asn	Val	Cys	Gln	Asp	Asn	Gln	Gln	Tyr	Gly	Asn	Asn	Ala	Gly	Asn	Phe		
	50					55					60						
Ala	Ser	Ser	Glu	Thr	Ile	Val	Gly	Val	Ser	Ala	Gly	Ile	Ile	Val	Val		
65					70					75					80		
Gly	Thr	Met	Leu	Gly	Ala	Phe	Ala	Ala	Pro	Val	Leu	Ala	Ala	Gly	Ile		
				85					90					95			
Ile	Ser	Phe	Gly	Thr	Leu	Leu	Pro	Ile	Phe	Trp	Gln	Gly	Ser	Asp	Pro		
			100					105					110				
Ala	Asn	Val	Trp	Gln	Asp	Leu	Leu	Asn	Ile	Gly	Gly	Arg	Pro	Ile	Gln		
		115				120						125					
Glu	Ile	Asp	Lys	Asn	Ile	Ile	Asn	Val	Leu	Thr	Ser	Ile	Val	Thr	Pro		
	130					135					140						
Ile	Lys	Asn	Gln	Leu	Asp	Lys	Tyr	Gln	Glu	Phe	Phe	Asp	Lys	Trp	Glu		
145					150					155					160		
Pro	Ala	Arg	Thr	His	Ala	Asn	Ala	Lys	Ala	Val	His	Asp	Leu	Phe	Thr		
				165					170						175		
Thr	Leu	Glu	Pro	Ile	Ile	Asp	Lys	Asp	Leu	Asp	Met	Leu	Lys	Asn	Asn		
			180					185					190				
Ala	Ser	Tyr	Arg	Ile	Pro	Thr	Leu	Pro	Ala	Tyr	Ala	Gln	Ile	Ala	Thr		
		195					200					205					
Trp	His	Leu	Asn	Leu	Leu	Lys	His	Ala	Ala	Thr	Tyr	Tyr	Asn	Ile	Trp		
	210					215						220					
Leu	Gln	Asn	Gln	Gly	Ile	Asn	Pro	Ser	Thr	Phe	Asn	Ser	Ser	Asn	Tyr		
225					230					235					240		
Tyr	Gln	Gly	Tyr	Leu	Lys	Arg	Lys	Ile	Gln	Glu	Tyr	Thr	Asp	Tyr	Cys		
				245					250					255			
Ile	Gln	Thr	Tyr	Asn	Ala	Gly	Leu	Thr	Met	Ile	Arg	Thr	Asn	Thr	Asn		
				260					265					270			



<213> *Bacillus thuringiensis*

<400> 13

Met	His	Tyr	Tyr	Gly	Asn	Arg	Asn	Glu	Tyr	Asp	Ile	Leu	Asn	Ala	Ser	1	5	10	15
Ser	Asn	Asp	Ser	Asn	Met	Ser	Asn	Thr	Tyr	Pro	Arg	Tyr	Pro	Leu	Ala	20	25	30	
Asn	Pro	Gln	Gln	Asp	Leu	Met	Gln	Asn	Thr	Asn	Tyr	Lys	Asp	Trp	Leu	35	40	45	
Asn	Val	Cys	Glu	Gly	Tyr	His	Ile	Glu	Asn	Pro	Arg	Glu	Ala	Ser	Val	50	55	60	
Arg	Ala	Gly	Leu	Gly	Lys	Gly	Leu	Gly	Ile	Val	Ser	Thr	Ile	Val	Gly	65	70	75	80
Phe	Phe	Gly	Gly	Ser	Ile	Ile	Leu	Asp	Thr	Ile	Gly	Leu	Phe	Tyr	Gln	85	90	95	
Ile	Ser	Glu	Leu	Leu	Trp	Pro	Glu	Asp	Asp	Thr	Gln	Gln	Tyr	Thr	Trp	100	105	110	
Gln	Asp	Ile	Met	Asn	His	Val	Glu	Asp	Leu	Ile	Asp	Lys	Arg	Ile	Thr	115	120	125	
Glu	Val	Ile	Arg	Gly	Asn	Ala	Ile	Arg	Thr	Leu	Ala	Asp	Leu	Gln	Gly	130	135	140	
Lys	Val	Asp	Asp	Tyr	Asn	Asn	Trp	Leu	Lys	Lys	Trp	Lys	Asp	Asp	Pro	145	150	155	160
Lys	Ser	Thr	Gly	Asn	Leu	Ser	Thr	Leu	Val	Thr	Lys	Phe	Thr	Ala	Leu	165	170	175	
Asp	Ser	Asp	Phe	Asn	Gly	Ala	Ile	Arg	Thr	Val	Asn	Asn	Gln	Gly	Ser	180	185	190	
Pro	Gly	Tyr	Glu	Leu	Leu	Leu	Leu	Pro	Val	Tyr	Ala	Gln	Ile	Ala	Asn	195	200	205	
Leu	His	Leu	Leu	Leu	Leu	Arg	Asp	Ala	Gln	Ile	Tyr	Gly	Asp	Lys	Trp	210	215	220	
Trp	Ser	Ala	Arg	Ala	Asn	Ala	Arg	Asp	Asn	Tyr	Tyr	Gln	Ile	Gln	Leu	225	230	235	240
Glu	Lys	Thr	Lys	Glu	Tyr	Thr	Glu	Tyr	Cys	Ile	Asn	Trp	Tyr	Asn	Lys	245	250	255	
Gly	Leu	Asn	Asp	Phe	Arg	Thr	Ala	Gly	Gln	Trp	Val	Asn	Phe	Asn	Arg	260	265	270	
Tyr	Arg	Arg	Glu	Met	Thr	Leu	Thr	Val	Leu	Asp	Ile	Ile	Ser	Met	Phe	275	280	285	
Pro	Ile	Tyr	Asp	Ala	Arg	Leu	Tyr	Pro	Thr	Glu	Val	Lys	Thr	Glu	Leu	290	295	300	
Thr	Arg	Glu	Ile	Tyr	Ser	Asp	Val	Ile	Asn	Gly	Glu	Ile	Tyr	Gly	Leu	305	310	315	320
Met	Thr	Pro	Tyr	Phe	Ser	Phe	Glu	Lys	Ala	Glu	Ser	Leu	Tyr	Thr	Arg	325	330	335	
Ala	Pro	His	Leu	Phe	Thr	Trp	Leu	Lys	Gly	Phe	Arg	Phe	Val	Thr	Asn	340	345	350	
Ser	Ile	Ser	Tyr	Trp	Thr	Phe	Leu	Ser	Gly	Gly	Gln	Asn	Lys	Tyr	Ser	355	360	365	
Tyr	Thr	Asn	Asn	Ser	Ser	Ile	Asn	Glu	Gly	Ser	Phe	Arg	Gly	Gln	Asp	370	375	380	
Thr	Asp	Tyr	Gly	Gly	Thr	Ser	Ser	Thr	Ile	Asn	Ile	Pro	Ser	Asn	Ser	385	390	395	400
Tyr	Val	Tyr	Asn	Leu	Trp	Thr	Glu	Asn	Tyr	Glu	Tyr	Ile	Tyr	Pro	Trp	405	410	415	
Gly	Asp	Pro	Val	Asn	Ile	Thr	Lys	Met	Asn	Phe	Ser	Val	Thr	Asp	Asn	420	425	430	

Asn	Ser	Ser	Lys	Glu	Leu	Ile	Tyr	Gly	Ala	His	Arg	Thr	Asn	Lys	Pro
		435					440					445			
Val	Val	Arg	Thr	Asp	Phe	Asp	Phe	Leu	Thr	Asn	Lys	Glu	Gly	Thr	Glu
		450					455					460			
Leu	Ala	Lys	Tyr	Asn	Asp	Tyr	Asn	His	Ile	Leu	Ser	Tyr	Met	Leu	Ile
465					470					475					480
Asn	Gly	Glu	Thr	Phe	Gly	Gln	Lys	Arg	His	Gly	Tyr	Ser	Phe	Ala	Phe
				485					490					495	
Thr	His	Ser	Ser	Val	Asp	Pro	Asn	Asn	Thr	Ile	Ala	Ala	Asn	Lys	Ile
			500					505					510		
Thr	Gln	Ile	Pro	Val	Val	Lys	Ala	Ser	Ser	Ile	Asn	Gly	Ser	Ile	Ser
		515					520					525			
Ile	Glu	Lys	Gly	Pro	Gly	Phe	Thr	Gly	Gly	Asp	Leu	Val	Lys	Met	Arg
		530				535					540				
Ala	Asp	Ser	Gly	Leu	Thr	Met	Arg	Phe	Lys	Ala	Glu	Leu	Leu	Asp	Lys
545					550					555					560
Lys	Tyr	Arg	Val	Arg	Ile	Arg	Tyr	Lys	Cys	Asn	Tyr	Ser	Ser	Lys	Leu
				565					570					575	
Ile	Leu	Arg	Lys	Trp	Lys	Gly	Glu	Gly	Tyr	Ile	Gln	Gln	Gln	Ile	His
			580					585					590		
Asn	Ile	Ser	Pro	Thr	Tyr	Gly	Ala	Phe	Ser	Tyr	Leu	Glu	Ser	Phe	Thr
		595					600					605			
Ile	Thr	Thr	Thr	Glu	Asn	Ile	Phe	Asp	Leu	Thr	Met	Glu	Val	Thr	Tyr
		610				615					620				
Pro	Tyr	Gly	Arg	Gln	Phe	Val	Glu	Asp	Ile	Pro	Ser	Leu	Ile	Leu	Asp
625					630					635					640
Lys	Ile	Glu	Phe	Leu	Pro	Thr	Asn								
					645										

<210> 14

<211> 682

<212> PRT

<213> *Bacillus thuringiensis*

<400> 14

Met	Asn	Ser	Tyr	Gln	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Leu	Asp	Ala	Lys
1				5					10					15	
Arg	Asn	Thr	Cys	His	Met	Ser	Asn	Cys	Tyr	Pro	Lys	Tyr	Pro	Leu	Ala
			20					25					30		
Asn	Asp	Pro	Gln	Met	Tyr	Leu	Arg	Asn	Thr	His	Tyr	Lys	Asp	Trp	Ile
		35					40					45			
Asn	Met	Cys	Glu	Glu	Ala	Ser	Tyr	Ala	Ser	Ser	Gly	Pro	Ser	Gln	Leu
		50				55					60				
Phe	Lys	Val	Gly	Gly	Ser	Ile	Val	Ala	Lys	Ile	Leu	Gly	Met	Ile	Pro
65					70					75					80
Glu	Val	Gly	Pro	Leu	Ser	Trp	Met	Val	Ser	Leu	Phe	Trp	Pro	Thr	
				85				90					95		
Ile	Glu	Glu	Lys	Asn	Thr	Val	Trp	Glu	Asp	Met	Ile	Lys	Tyr	Val	Ala
			100					105					110		
Asn	Leu	Leu	Lys	Gln	Glu	Leu	Thr	Asn	Asp	Thr	Leu	Asn	Arg	Ala	Thr
		115					120					125			
Ser	Asn	Leu	Ser	Gly	Leu	Asn	Glu	Ser	Leu	Asn	Ile	Tyr	Asn	Arg	Ala
		130				135					140				
Leu	Ala	Ala	Trp	Lys	Gln	Asn	Lys	Asn	Asn	Phe	Ala	Ser	Gly	Glu	Leu
145					150					155					160
Ile	Arg	Ser	Tyr	Ile	Asn	Asp	Leu	His	Ile	Leu	Phe	Thr	Arg	Asp	Ile

Gln	Ser	Asp	Phe	Ser	Leu	Gly	Gly	Tyr	Glu	Thr	Val	Leu	Leu	Pro	Ser	165	170	175
			180						185					190				
Tyr	Ala	Ser	Ala	Ala	Asn	Leu	His	Leu	Leu	Leu	Leu	Arg	Asp	Val	Ala			
		195					200						205					
Ile	Tyr	Gly	Lys	Glu	Leu	Gly	Tyr	Pro	Ser	Thr	Asp	Val	Glu	Phe	Tyr			
	210					215					220							
Tyr	Asn	Glu	Gln	Lys	Tyr	Tyr	Thr	Glu	Lys	Tyr	Ser	Asn	Tyr	Cys	Val			
225					230					235					240			
Asn	Thr	Tyr	Lys	Ser	Gly	Leu	Glu	Ser	Lys	Lys	Gln	Ile	Gly	Trp	Ser			
			245						250						255			
Asp	Phe	Asn	Arg	Tyr	Arg	Arg	Glu	Met	Thr	Leu	Ser	Val	Leu	Asp	Ile			
		260						265					270					
Val	Ala	Leu	Phe	Pro	Leu	Tyr	Asp	Thr	Gly	Leu	Tyr	Pro	Ser	Lys	Asp			
		275					280						285					
Gly	Lys	Ile	His	Val	Lys	Ala	Glu	Leu	Thr	Arg	Glu	Ile	Tyr	Ser	Asp			
	290					295					300							
Val	Ile	Asn	Asp	His	Val	Tyr	Gly	Leu	Met	Val	Pro	Tyr	Ile	Ser	Phe			
305					310					315					320			
Glu	His	Ala	Glu	Ser	Leu	Tyr	Thr	Arg	Arg	Pro	His	Ala	Phe	Thr	Trp			
			325					330							335			
Leu	Lys	Gly	Phe	Arg	Phe	Val	Thr	Asn	Ser	Ile	Asn	Ser	Trp	Thr	Phe			
		340					345						350					
Leu	Ser	Gly	Gly	Glu	Asn	Arg	Tyr	Phe	Leu	Thr	His	Gly	Glu	Gly	Thr			
	355					360						365						
Ile	Tyr	Asn	Gly	Pro	Phe	Leu	Gly	Gln	Asp	Thr	Glu	Tyr	Gly	Gly	Thr			
	370					375					380							
Ser	Ser	Tyr	Ile	Asp	Ile	Ser	Asn	Asn	Ser	Ser	Ile	Tyr	Asn	Leu	Trp			
385					390					395					400			
Thr	Lys	Asn	Tyr	Glu	Trp	Ile	Tyr	Pro	Trp	Thr	Asp	Pro	Val	Asn	Ile			
			405						410						415			
Thr	Lys	Ile	Asn	Phe	Ser	Ile	Thr	Asp	Asn	Ser	Asn	Ser	Ser	Glu	Ser			
		420						425					430					
Ile	Tyr	Gly	Ala	Glu	Arg	Met	Asn	Lys	Pro	Thr	Val	Arg	Thr	Asp	Phe			
	435					440						445						
Asn	Phe	Leu	Leu	Asn	Arg	Ala	Gly	Asn	Gly	Pro	Thr	Thr	Tyr	Asn	Asp			
	450					455				460								
Tyr	Asn	His	Ile	Leu	Ser	Tyr	Met	Leu	Ile	Asn	Gly	Glu	Thr	Phe	Gly			
465					470					475					480			
Gln	Lys	Arg	His	Gly	Tyr	Ser	Phe	Ala	Phe	Thr	His	Ser	Ser	Val	Asp			
			485					490							495			
Arg	Tyr	Asn	Thr	Ile	Val	Pro	Asp	Lys	Ile	Val	Gln	Ile	Pro	Ala	Val			
		500						505					510					
Lys	Thr	Asn	Leu	Val	Gly	Ala	Asn	Ile	Ile	Lys	Gly	Pro	Gly	His	Thr			
	515					520						525						
Gly	Gly	Asp	Leu	Leu	Lys	Leu	Glu	Tyr	Glu	Arg	Phe	Leu	Ser	Leu	Arg			
	530					535					540							
Ile	Lys	Leu	Ile	Ala	Ser	Met	Thr	Phe	Arg	Ile	Arg	Ile	Arg	Tyr	Ala			
545					550					555					560			
Ser	Asn	Ile	Ser	Gly	Gln	Met	Met	Ile	Asn	Ile	Gly	Tyr	Gln	Asn	Pro			
			565					570							575			
Thr	Tyr	Phe	Asn	Ile	Ile	Pro	Thr	Thr	Ser	Arg	Asp	Tyr	Thr	Glu	Leu			
		580						585							590			
Lys	Phe	Glu	Asp	Phe	Gln	Leu	Val	Asp	Thr	Ser	Tyr	Ile	Tyr	Ser	Gly			
	595					600						605						
Gly	Pro	Ser	Ile	Ser	Ser	Asn	Thr	Leu	Trp	Leu	Asp	Asn	Phe	Ser	Asn			
	610					615					620							

Gly	Pro	Val	Ile	Ile	Asp	Lys	Ile	Glu	Phe	Ile	Pro	Leu	Gly	Ile	Thr
625					630					635					640
Leu	Asn	Gln	Ala	Gln	Gly	Tyr	Asp	Thr	Tyr	Asp	Gln	Asn	Ala	Asn	Gly
				645						650					655
Met	Tyr	His	Gln	Asn	Tyr	Ser	Asn	Ser	Gly	Tyr	Asn	Tyr	Asn	Gln	Glu
			660						665					670	
Tyr	Asn	Thr	Tyr	Tyr	Gln	Ser	Tyr	Asn	Asn						
		675						680							

<210> 15

<211> 674

<212> PRT

<213> Bacillus thuringiensis

<400> 15

Met	Asn	Gln	Tyr	Gln	Asn	Lys	Asn	Glu	Tyr	Glu	Ile	Leu	Glu	Ser	Ser
1				5					10					15	
Gln	Asn	Asn	Met	Asn	Met	Pro	Asn	Arg	Tyr	Pro	Phe	Ala	Asp	Asp	Pro
			20					25					30		
Asn	Ala	Val	Met	Lys	Asn	Gly	Asn	Tyr	Lys	Asp	Trp	Val	Asn	Glu	Cys
		35					40						45		
Glu	Gly	Ser	Asn	Ile	Ser	Pro	Ser	Pro	Ala	Ala	Ala	Ile	Thr	Ser	Lys
	50					55					60				
Ile	Val	Ser	Ile	Val	Leu	Lys	Thr	Leu	Ala	Lys	Ala	Val	Ala	Ser	Ser
65					70					75					80
Leu	Ala	Asp	Ser	Ile	Lys	Ser	Ser	Leu	Gly	Ile	Ser	Lys	Thr	Ile	Thr
				85					90					95	
Glu	Asn	Asn	Val	Ser	Gln	Val	Ser	Met	Val	Gln	Val	His	Gln	Ile	Ile
			100					105					110		
Asn	Arg	Arg	Ile	Gln	Glu	Thr	Ile	Leu	Asp	Leu	Gly	Glu	Ser	Ser	Leu
			115				120					125			
Asn	Gly	Leu	Val	Ala	Ile	Tyr	Asn	Arg	Asp	Tyr	Leu	Gly	Ala	Leu	Glu
	130						135				140				
Ala	Trp	Asn	Asn	Asn	Lys	Ser	Asn	Ile	Asn	Tyr	Gln	Thr	Asn	Val	Ala
145					150					155					160
Glu	Ala	Phe	Lys	Thr	Val	Glu	Arg	Glu	Phe	Phe	Thr	Lys	Leu	Lys	Gly
				165					170					175	
Ile	Tyr	Arg	Thr	Ser	Ser	Ser	Gln	Ile	Thr	Leu	Leu	Pro	Thr	Phe	Thr
			180					185					190		
Gln	Ala	Ala	Asn	Leu	His	Leu	Ser	Met	Leu	Arg	Asp	Ala	Val	Met	Tyr
		195					200					205			
Gln	Glu	Gly	Trp	Asn	Leu	Gln	Ser	His	Ile	Asn	Tyr	Ser	Lys	Glu	Leu
	210					215					220				
Asp	Asp	Ala	Leu	Glu	Asp	Tyr	Thr	Asn	Tyr	Cys	Val	Glu	Val	Tyr	Thr
225					230					235					240
Lys	Gly	Leu	Asn	Ala	Leu	Arg	Gly	Ser	Thr	Ala	Ile	Asp	Trp	Leu	Glu
				245					250					255	
Phe	Asn	Ser	Phe	Arg	Arg	Asp	Met	Thr	Leu	Met	Val	Leu	Asp	Leu	Val
			260					265					270		
Ala	Ile	Phe	Pro	Asn	Tyr	Asn	Pro	Val	Arg	Tyr	Pro	Leu	Ser	Thr	Lys
		275					280					285			
Ile	Ser	Leu	Ser	Arg	Lys	Ile	Tyr	Thr	Asp	Pro	Val	Gly	Arg	Thr	Asp
	290					295					300				
Ser	Pro	Ser	Phe	Gly	Asp	Trp	Thr	Asn	Thr	Gly	Arg	Thr	Leu	Ala	Asn
305					310					315				320	
Phe	Asn	Asp	Leu	Glu	Arg	Glu	Val	Thr	Asp	Ser	Pro	Ser	Leu	Val	Lys

Trp	Leu	Gly	Asp	Met	Thr	Ile	Tyr	Thr	Gly	Ala	Ile	Asp	Ser	Tyr	Arg	325	330	335
			340						345				350					
Pro	Thr	Ser	Pro	Gly	Asp	Arg	Ile	Gly	Val	Trp	Tyr	Gly	Asn	Ile	Asn			
		355					360					365						
Ala	Phe	Tyr	His	Thr	Gly	Arg	Thr	Asp	Val	Val	Met	Phe	Arg	Gln	Thr			
	370					375					380							
Gly	Asp	Thr	Ala	Tyr	Glu	Asp	Pro	Ser	Thr	Phe	Ile	Ser	Asn	Ile	Leu			
385					390					395				400				
Tyr	Asp	Asp	Ile	Tyr	Lys	Leu	Asp	Leu	Arg	Ala	Ala	Ala	Val	Ser	Thr			
			405						410					415				
Ile	Gln	Gly	Ala	Met	Asp	Thr	Thr	Phe	Gly	Val	Ser	Ser	Ser	Arg	Phe			
		420						425					430					
Phe	Asp	Ile	Arg	Gly	Arg	Asn	Gln	Leu	Tyr	Gln	Ser	Asn	Lys	Pro	Tyr			
		435				440						445						
Pro	Ser	Leu	Pro	Ile	Thr	Ile	Thr	Phe	Pro	Gly	Glu	Glu	Ser	Ser	Glu			
	450					455					460							
Gly	Asn	Ala	Asn	Asp	Tyr	Ser	His	Leu	Leu	Cys	Asp	Val	Lys	Ile	Leu			
465					470					475				480				
Gln	Glu	Asp	Ser	Ser	Asn	Ile	Cys	Glu	Gly	Arg	Ser	Ser	Leu	Leu	Ser			
			485						490				495					
His	Ala	Trp	Thr	His	Ala	Ser	Leu	Asp	Arg	Asn	Asn	Thr	Ile	Leu	Pro			
			500					505				510						
Asp	Glu	Ile	Thr	Gln	Ile	Pro	Ala	Val	Thr	Ala	Tyr	Glu	Leu	Arg	Gly			
		515				520						525						
Asn	Ser	Ser	Val	Val	Ala	Gly	Pro	Gly	Ser	Thr	Gly	Gly	Asp	Leu	Val			
	530					535					540							
Lys	Met	Ser	Tyr	His	Ser	Val	Trp	Ser	Phe	Lys	Val	Tyr	Cys	Ser	Glu			
545					550					555				560				
Leu	Lys	Asn	Tyr	Arg	Val	Arg	Ile	Arg	Tyr	Ala	Ser	His	Gly	Asn	Cys			
			565						570				575					
Gln	Phe	Leu	Met	Lys	Arg	Trp	Pro	Ser	Thr	Gly	Val	Ala	Pro	Arg	Gln			
		580						585				590						
Trp	Ala	Arg	His	Asn	Val	Gln	Gly	Thr	Phe	Ser	Asn	Ser	Met	Arg	Tyr			
		595				600						605						
Glu	Ala	Phe	Lys	Tyr	Leu	Asp	Ile	Phe	Thr	Ile	Thr	Pro	Glu	Glu	Asn			
	610					615					620							
Asn	Phe	Ala	Phe	Thr	Ile	Asp	Leu	Glu	Ser	Gly	Gly	Asp	Leu	Phe	Ile			
625					630					635				640				
Asp	Lys	Ile	Glu	Phe	Ile	Pro	Val	Ser	Gly	Ser	Ala	Phe	Glu	Tyr	Glu			
			645						650				655					
Gly	Lys	Gln	Asn	Ile	Glu	Lys	Thr	Gln	Lys	Ala	Val	Asn	Asp	Leu	Phe			
			660					665					670					
Ile	Asn																	